



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/758,843

01/16/2004

Sunil G. Warrior

02-508

6939

34704

7590

09/11/2007

BACHMAN & LAPOINTE, P.C.

900 CHAPEL STREET

SUITE 1201

NEW HAVEN, CT 06510

EXAMINER

CREPEAU, JONATHAN

ART UNIT

PAPER NUMBER

1745

MAIL DATE

DELIVERY MODE

09/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/758,843

**Applicant(s)**

WARRIER ET AL.

**Examiner**

Jonathan S. Crepeau

**Art Unit**

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-25,28-49 and 52-58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-25,28-49 and 52-58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1, 4-25, 28-49, 52, and newly added claims 53-58. Claims 4-9, 28-33, and 52 are newly rejected under 35 USC 112, second paragraph. Claims 1, 4-25, 28-49, and 52 remain rejected for the reasons of record, and claims 53-58 are newly rejected under 35 USC 103 as necessitated by amendment. Accordingly, this action is made final.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4-9, 28-33, and 52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 4, 28, and 52 each recite “a first plurality of substructures disposed in a first direction and a second plurality of substructures disposed in a second direction...so as to define a woven structure.” However, each of the respective parent claims has been amended to recite a “woven substructure.” Thus, claims 4, 28, and 52 define “substructure” differently than the parent claims, which creates a lack of clarity. Amendment of claims 4-9, 28-33 and 52 to properly further limit claims 1, 25, and 49 is required.

***Claim Rejections - 35 USC § 102***

4. Claims 1, 4, 6, 7, 10, 11, 21, 23-25, 28, 30, 31, 34, 35, 45, 47-49, and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 99/13522. The reference is directed to a solid oxide fuel cell assembly comprising an interconnect assembly comprising a separator plate (122), a silver alloy mesh (136) contacting one side of the plate, and a nickel mesh (144) contacting the other side of the plate (see abstract; Fig. 4). The sides of the mesh contacting the separator are “first portions” and the sides of the mesh contacting the electrodes are “second portions.” The meshes are “superstructures” which comprise a woven substructure, which can be defined as a discrete portion of the superstructure. The silver in mesh 136 may be combined with another material to form a composite or may be formed on stainless steel (see abstract).

Thus, the instant claims are anticipated.

5. Claims 1, 4-7, 10, 11, 19, 21, 25, 28-31, 34, 35, 43, and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Singh (U.S. Patent 4,389,467). The reference is directed to a molten carbonate fuel cell assembly comprising an interconnect assembly comprising a separator plate (11), and current collectors (27, 29) contacting the separator plate. The current collectors are corrugated stainless steel wire meshes which form sinusoidal cross-sectional channels (see Fig. 1; col. 4, line 27-32). The areas of the mesh contacting the separator are “first portions” and the areas of the mesh contacting the electrodes (13, 15) are “second portions.” The meshes are three-dimensional “superstructures” which comprises a woven substructure.

Art Unit: 1745

Although the fuel cell of the reference is a molten carbonate fuel cell, the instant claims do not positively recite a solid oxide fuel cell and are thus anticipated by the reference.

6. Claims 1, 4-7, 1115-18, 21, 24, 25, 28-31, 35, 39-42, 45, and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by DE 19517443. The reference is directed to a molten carbonate fuel cell assembly comprising an interconnect assembly comprising a separator plate and current collectors contacting the separator plates (see translation, page 2). The current collectors are nickel-coated stainless steel wire meshes which form square, rectangular, or slanted cross-sectional channels (see Figs. 4a, 4b). The areas of the mesh contacting the separator are “first portions” and the areas of the mesh contacting the anode are “second portions.” The meshes are three-dimensional “superstructures,” which comprises a woven substructure. Although the fuel cell of the reference is a molten carbonate fuel cell, the instant claims do not positively recite a solid oxide fuel cell and are thus anticipated by the reference.

***Claim Rejections - 35 USC § 103***

7. Claims 8, 9, 12-14, 19, 20, 32, 33, 36-38, 43, 44, and 52-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19517443.

The reference is applied to claims 1, 4-7, 11, 15-18, 21, 24, 25, 28-31, 35, 39-42, 45, and 48 for the reasons stated above. However, the reference does not expressly teach that the current collectors are dimpled (claims 8, 9, 32, and 33) or that they define sinusoidal or hourglass-shaped channels or that the connecting portions converge (claims 19, 20, 43, 44, 53-58), or that the compliance of the current collector is within the ranges defined by claims 12-14 and 36-38.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of DE '443 fairly suggests the claimed shapes and ranges of compliance. On page 3 of the translation, the reference teaches that “[v]ery different mechanical and electrical characteristics of the current collector can be achieved by the different shaping of the wire mesh, i.e. different contact areas and kiss pressures both on the side to the electrode as well as on that the bipolar plate of the gas cell turned side.” Accordingly, this disclosure would motivate the artisan to change the shape of the current collector to affect the mechanical and electrical characteristics. As such, the shapes recited in the instant claims are not considered to involve an inventive step over DE '443. Additionally, the ranges of compliance recited in claims 12-14 and 36-38 are also not considered to involve an inventive step since the reference suggests modifying the mechanical characteristics and kiss pressure of the current collector.

8. Claims 22 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19517443 in view of Minh (U.S. Patent 6,296,962).

DE 19517443 is applied to claims 1, 4-7, 11, 15-18, 21, 24, 25, 28-31, 35, 39-42, 45, and 48 for the reasons stated above. However, the reference does not expressly teach that the current collectors are made of a chromium-based alloy.

Minh teaches a solid oxide fuel cell current collector that is made of a nickel-chromium or iron-chromium based material (see col. 4, line 16).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Minh would motivate the artisan to use these materials in the current collector of DE '443. In column 4, line 14, Minh teaches that these materials are “preferably” used and that they are oxidation-resistant. As such, the artisan would be motivated to use these materials in the current collector of DE '443.

### ***Response to Arguments***

9. Applicant's arguments filed July 2, 2007 have been fully considered but they are not persuasive. Applicants state that “[i]n connection with all these claims, it is pointed out that the superstructure is itself defined by a woven substructure as these terms are defined in the specification.” However, the specification has been reviewed and no definition can be found for “superstructure” and “substructure.” As such, these terms are given their broadest reasonable interpretation herein. It is further stated that the claims call for a “woven substructure formed to define a superstructure having the spaced contact zones as claimed.” However, the limitation “spaced contact zones” is not recited in the claims. Even if this language were to be inserted into

the claims, it is submitted that each of the above-applied references teaches this feature. With regard to WO '522, even though the mesh is in a flat configuration, the surfaces are still "spaced" from each other by the thickness of the mesh. Further, each of the references teaches a "woven substructure" formed to define a "superstructure." With regard to Singh and to DE '443, these references disclose meshes formed into three-dimensional structures that are compliant in the thickness direction. This configuration clearly corresponds to the claimed "superstructure." With regard to WO '522, the "superstructure" may be defined as the entire mesh and the "woven substructure" is simply a section of that mesh. Accordingly, the claimed configurations are still met by the references.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37



CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau  
Primary Examiner  
Art Unit 1745  
September 7, 2007